

# IDAHO DEPARTMENT OF FISH AND GAME

**Jerry M. Conley, Director**

FEDERAL AID IN FISH RESTORATION

Job Performance Report

Project F-71-R-11



## REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS

Job No. 6(IF)-b. Region 6 (Idaho Falls) Lowland Lakes and Reservoirs  
Investigations

Job No. 6(IF)-c<sup>1</sup>. Region 6 (Idaho Falls) Rivers and Streams Investigations

Job No. 6(IF)-c<sup>2</sup>. Region 6 (Idaho Falls) Rivers and Streams Investigations -- Big  
Lost River Survey

Job No. 6(IF)-d. Region 6 (Idaho Falls) Technical Guidance

by

Steve Elie, Regional Fishery Manager  
Chip Corsi, Regional Fishery Biologist  
Dennis Aslett, Wildlife Land Manager, Senior

October 1987

## TABLE OF CONTENTS

	<u>Page</u>
<u>Job No. 6(IF)-b.      Region 6 (Idaho Falls) Lowland Lakes and Reservoirs Investigations</u>	
ABSTRACT .....	1
OBJECTIVES .....	3
RECOMMENDATIONS .....	3
TECHNIQUES .....	4
Ririe Reservoir .....	4
Mud Lake .....	4
Greens Pond .....	4
Roberts Gravel Pond .....	4
Island Park Reservoir .....	5
Henrys Lake Cofferdam .....	5
Boyles Oxbow .....	5
Sand Creek .....	5
FINDINGS .....	6
Ririe Reservoir .....	6
Mud Lake .....	10
Greens Pond .....	10
Roberts Gravel Pond .....	10
Island Park Reservoir .....	10
Henrys Lake Cofferdam .....	14
Boyles Oxbow .....	14
Sand Creek WMA .....	14
ACKNOWLEDGMENTS .....	18
LITERATURE CITED .....	19

## LIST OF TABLES

Table 1. Angler effort by interval, Ririe Reservoir, 1986. . .	7
Table 2. Catch rates and % catch composition, Ririe Reservoir, 1986 .....	7
Table 3. Estimated return to creel of stocked fish, Ririe Reservoir, 1986 .....	8
Table 4. Mean total length (mm) of fish harvested, Ririe Reservoir, 1986 .....	8

## LIST OF TABLES (Continued)

	<u>Page</u>
Table 5. Numbers of fish captured in spring gillnetting surveys, Ririe Reservoir, 1983 to 1986 .....	9
Table 6. Numbers of fish captured in trap netting survey, Mud Lake, 1986 .....	11
Table 7. Numbers of fish captured in gill net surveys, Island Park Reservoir, 1976 to 1986 .....	13
Table 8. Creel census summary at Sand Creek WMA (by pond), May 24 to September 12,, 1986 .....	15
Table 9. Comparison of estimated angler effort, harvest and catch rates. Sand Creek Wildlife Management Area, 1979, 1981 and 1986 .....	15
Table 10. Percent return to creel of hatchery fish stocked into Sand Creek Wildlife Management Area ponds, 1986. ....	17
Table 11. Mean length (mm) of fish harvested from the Sand Creek Wildlife Management Area ponds, 1986 .....	17

## LIST OF FIGURES

Figure 1. Length frequencies of game species captured by electrofishing in Mud Lake, 1986 .....	12
---	----

### Job No. 6(IF)-c<sup>1</sup>.      Region 6 (Idaho Falls) Rivers and Streams Investigations

ABSTRACT .....	20
OBJECTIVES .....	22
RECOMMENDATIONS .....	22
TECHNIQUES .....	23
South Fork Snake River .....	23
Pritchard Creek .....	23
Mill Creek .....	24
Little Lost River Drainage .....	24
Egin Canal .....	24
Henrys Lake Outlet .....	23
Twin Creek .....	25
Targhee Creek .....	25

## TABLE OF CONTENTS (Continued)

	<u>Page</u>
FINDINGS .....	25
South Fork Snake River .....	25
Population Estimates .....	25
Redd Surveys .....	29
Salvage .....	35
Pritchard Creek .....	35
Mill Creek .....	35
Little Lost River Drainage .....	38
Egin Canal .....	38
Henrys Lake Outlet .....	41
Salvage .....	41
Twin Creek .....	41
Targhee Creek .....	41
LITERATURE CITED .....	43
Table 1. Catch data by age and mortality coefficients (Z, A and S) for South Fork Snake River cutthroat trout in the Conant Valley area, 1986 .....	33
Table 2. Brown trout redd counts on the South Fork Snake River 1979 to present .....	34
Table 3. Electrofishing results from Sawmill Creek, 1984 to 1986 .....	36

## LIST OF FIGURES

Figure 1. Species composition of fish captured by electrofishing in the Conant Valley reach of the South Fork Snake River, 1986 .....	26
Figure 2. Length frequency distribution of cutthroat trout captured by electrofishing in the Conant Valley reach of the South Fork Snake River, 1986 .....	27
Figure 3. Length frequency distribution of brown trout captured by electrofishing in the Conant Valley reach of the South Fork Snake River, 1986 .....	28
Figure 4. Fish population density estimates in the Conant Valley reach of the South Fork Snake River, 1986. . .	30

## LIST OF FIGURES (Continued)

	<u>Page</u>
Figure 6. Catch curve for the wild cutthroat trout population of the South Fork Snake River special regulations area, 1986 .....	32
Figure 7. Trend in brown trout redd counts, South Fork Snake River, from 1979 to 1986 .....	37
Figure 8. Length frequency distribution of fish captured in Sawmill Creek during 1986 .....	39
Figure 9. Length frequency distribution of fish captured from Summit Creek during 1986 .....	40
Figure 10. Length frequency distribution of fish captured from Henrys Lake Outlet during 1986 .....	42
<u>Job No. 6(IF)-c<sup>2</sup>.      Region 6 (Idaho Falls) Rivers and Streams</u> <u>Investigations -- Big Lost River Survey</u>	
ABSTRACT .....	45
<u>Job No. 6(IF)-d.      Region 6 (Idaho Falls) Technical Guidance</u>	
ABSTRACT .....	47
OBJECTIVES .....	48
TECHNIQUES USED .....	48
FINDINGS .....	48

## JOB PERFORMANCE REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT  
INVESTIGATIONS

Project No.: F-71-R-11

Job No.: 6(IF)-b

Title: Region 6 (Idaho Falls)  
Lowland Lakes and Reservoirs  
Investigations

Period Covered: July 1, 1986 to June 30, 1987

### ABSTRACT

Estimated angler effort on Ririe Reservoir during 1986 was 61,910 hours, a 55% decline from the 1982 estimate. Catch and harvest rates were 0.71 fish/hr and 0.61 fish/hr, respectively, with bank anglers less successful than boat anglers. Catchable rainbow trout provided the bulk of the harvest followed by coho salmon. Return to the creel by rainbow trout fingerlings in 1986 was considerably lower than in 1982 (1.8% versus 8.0%). Reduced effort at Ririe Reservoir may be partially attributable to the resurgence in the Henrys Lake and Island Park Reservoir fisheries. Spring gillnetting indicated a slight decline in the percentage of nongame fish. Smallmouth bass introductions in 1986 totaled 201 fish, with all age classes present. Smallmouth bass reproduction was documented in Ririe Reservoir in 1986.

Netting and electrofishing in Mud Lake continue to show Utah chubs and Utah suckers as the dominant fish species. Insufficient numbers of largemouth bass were captured for the calculation of proportional stock density (PSD).

Greens Pond, a small, privately owned gravel pond near Roberts, was found to contain large numbers of largemouth bass and bluegill of all age classes. The fish were evidently introduced inadvertently by Department hatchery personnel transferring fish from Carey Lake during 1983. Evidently, reproduction and overwintering are occurring in the pond. We will attempt to obtain an easement for a fishery or obtain fish for redistribution within the region.

Approximately 16 largemouth bass and 134 bluegill were transported to the Roberts gravel pond from Region 5 waters. No winterkill was observed as a result of mild conditions.

Nongame fish populations in Island Park Reservoir are at a high level as indicated by gillnetting. One cutthroat trout was taken in the gill nets, the first since 1966.

A cooperative effort by the Idaho Department of Fish and Game (IDFG), the Henrys Lake Foundation (HLF) and the North Fork Water Company resulted in the raising of the cofferdam at Henrys Lake during construction. This allowed for maintenance of higher lake levels during construction and through the winter period, possibly preventing anoxic conditions and allowing the lake to fill despite low runoff.

Boyles oxbow lake appears to be a suitable site for the reintroduction of a spiny ray fish for later use as a broodstock source.

Anglers fished an estimated 13,599 hours from May 24 through September 12 at the five Sand Creek WMA ponds. Overall catch rate was 0.63 fish/hr, with a harvest rate of 0.56 fish/hr. Anglers were primarily bait fishermen (82Z); and although interested in using special regulations to improve the fishery, they were not interested in using gear restrictions to do so. Low returns of planted brook trout to the creel are indicative of low survival. Curtailment of brook trout stocking is recommended.

Authors:

Steve Elle  
Regional Fishery Manager

Chip Corsi  
Regional Fishery Biologist

Dennis Aslett  
Wildlife Land Manager, Senior

## **OBJECTIVES**

1. To evaluate the status of the Ririe Reservoir fishery with respect to effort, catch and harvest rates and fish size. Evaluate success of smallmouth bass introductions.
2. To assess the status of fish populations in Mud Lake, Roberts gravel pond and Greens Pond.
3. To reduce possibility of winterkill at Henrys Lake as a result of construction drawdown.
4. To evaluate the status of the Sand Creek WMA fishery with respect to effort, catch and harvest rates, return to the creel and angler attitudes.

## **RECOMMENDATIONS**

1. Increase size at stocking of coho salmon fingerlings into Ririe Reservoir.
2. Time introductions of all fingerlings into Ririe Reservoir to coincide with plankton blooms (water temperatures at least 10°C).
3. Assess establishment progress of a smallmouth bass population and utilization of the forage base.
4. Improve sampling efficiency for largemouth bass at Mud Lake to allow for assessment of the largemouth bass population and to assess the success of other spiny ray fish introductions.
5. Work with landowner at Greens Pond to obtain a fishing easement or to purchase fish for stocking in other waters.
6. Finish hook-up of aeration system at Roberts gravel pond and continue fish introductions until bass and bluegill populations are established.
7. Establish spiny ray fish populations in Boyles oxbow lake for later use as a broodstock source.
8. Curtail introduction of brook trout into Sand Creek WMA ponds.



## TECHNIQUES USED

### Ririe Reservoir

A creel census was conducted on Ririe Reservoir during the general fishing season in 1986. Techniques were identical to those used in 1982 (Moore et al. 1983), except that holidays were treated as weekend days, and the angler opinion questionnaire was limited to one question on the trend in fishing.

Experimental gill nets were set overnight from May 12 to May 13, 1986, in the Meadow Creek and Willow Creek arms. Standard mesh nets were set during the same period across from the Juniper boat ramp.

During April and June of 1986, smallmouth bass were collected from Little Camas Reservoir and stocked into Ririe Reservoir to augment earlier transplants.

### Mud Lake

We collected fish from Mud Lake with trap nets and electrofishing gear. Trap nets were fished from April 21 to May 18, 1986, with sets made at North Bay (behind the headquarters), at the mouth of Camas Creek and at the southern boat launch. Electrofishing was conducted at night on September 17 behind headquarters where Christmas tree structures had been placed during January of 1986.

### Greens Pond

Greens Pond, a small, privately owned gravel pond near Roberts, was snorkeled on June 12 to assess fish populations there.

### Roberts Gravel Pond

Largemouth bass and bluegill were captured by sportsmen in Twin Lakes and Condie Reservoir on two occasions. Captured fish were held in live boxes and then transplanted to Roberts gravel pond by truck.

We proceeded with our efforts to get an electrically powered aerator installed.

### Island Park Reservoir

Three experimental gill nets were set overnight from May 19 to 20 in Island Park Reservoir at locations sampled during previous years to monitor species composition (Corsi and Elle 1986).

### Henrys Lake Cofferdam

In order to complete dam repairs at the Henrys Lake Dam, the North Fork Water Company constructed a cofferdam several hundred meters upstream from the Henrys Lake Dam. In cooperation with the Henrys Lake Foundation, the IDFG provided additional funds to build the cofferdam higher, place a culvert to maintain flows in Henrys Lake Outlet and seal the cofferdam with waterproof material to prevent saturation of the dam fill. Work was done during the first week of September.

### Boyles Oxbow

A trap net and a gill net were set in the oxbow lake on the Boyle property near Menan to assess fish species composition. The nets were fished one night each (May 21 to May 22). We also examined the lake as a possible location for a spiny ray fish introduction to be used as a broodstock source for Region 6.

### Sand Creek

Creel census was conducted at the Sand Creek ponds, including Blue Creek Reservoir, from May 24 through September 1, 1986. One weekday and one weekend were chosen at random to be sampled during each of eight two-week intervals. Four counts were made at randomly selected times on each count day. All counts were made from a vehicle. Estimates of effort and catch rates were made using the same methodology described by Corsi and Elle (1986). In order to estimate effort from Labor Day to November 30, we conducted an analysis of the trend in effort during that same time period at the Sand Creek ponds during 1979 and 1981 seasons and then applied the trend to the 1986 data.

Anglers were also asked how they rated the fishery, what they thought the trend in fishing was and if they would favor special regulations to improve the fishery.

## FINDINGS

### Ririe Reservoir

Angling effort on Ririe Reservoir declined 55% from the 1982 estimate of 137,017 hours to 61,910 hours in 1986. Effort intensity declined from 225.7 hours/hectare to 102.0 hours/hectare; however, Ririe Reservoir is still probably one of the most intensively fished reservoirs in the state (Moore et al. 1983). Peak effort occurred during the first two weeks of the season and declined thereafter (Table 1). Bank anglers accounted for 55% of the effort compared with 49% in 1982.

Catch rates increased from 1982 to 0.71 fish/hr in 1986, with a harvest rate of 0.61 fish/hr, meeting management goals of 0.60 fish/hr. The 1986 catch rate is the highest recorded for Ririe Reservoir since impoundment (Table 2). Boat anglers, with catch and harvest rates of 0.81 fish/hr and 0.67 fish/hr, respectively, were more successful than bank anglers (0.61 fish/hr and 0.55 fish/hr). Catchable rainbow trout provided the majority of the harvest, followed by coho salmon (Table 2).

Rainbow trout fingerlings had a poor return to the creel in 1986 (1.8% compared with 8.0% in 1982). This can be attributed partially to the reduced effort, but return to the creel on catchable rainbow trout and coho salmon fingerlings declined at a much lower rate (Table 3).

Reduced effort at Ririe Reservoir is probably partially due to the resurgence of the Island Park Reservoir and Henrys Lake fisheries. Many anglers voiced the opinion that numbers of larger-sized fish had declined, which in fact, they had for rainbow trout (Table 4). The perception of a declining fishery (40% of the anglers having an opinion) may also be contributing to the declining angler effort at Ririe Reservoir.

Gillnetting during May 1986 showed little change in the percent composition of Utah chubs, but Utah suckers declined and rainbow trout increased (Table 5). The actual number of cutthroat trout captured increased, but due to the large number of rainbow trout fingerlings captured in Willow Creek arm, their percent composition declined. As in the past (Corsi 1986), cutthroat trout were predominately subadult fish. Cutthroat >330 mm were sexually mature. Length of cutthroat trout ranged from 215 mm to 410 mm. Rainbow trout ranged from 186 mm to 395 mm and coho salmon from 190 mm to 266 mm. A single brown trout measured was 467 mm long.

A total of 201 smallmouth bass were released in Ririe Reservoir in 1986. All fish came from Little Camas Reservoir with all age classes being represented. The total number of smallmouth bass stocked in Ririe Reservoir by the end of 1986 equaled 1,248, of which 75% were age 1+ or older fish. Scuba diving in August 1986 revealed the presence of large numbers of young-of-the-year smallmouth bass, indicating that natural reproduction is occurring. No additional transplants are scheduled at this time.

Table 1. Angler effort by interval, Ririe Reservoir, 1986.

Interval	Dates		Method		Total
			Bank	Boat	
1	5/24	to 6/6	8,631	5,994	14,625
2	6/7	to 6/20	4,665	3,504	8,169
3	6/21	to 7/4	4,786	3,632	8,418
4	7/5	to 7/18	2,993	2,000	4,993
5	7/19	to 8/1	2,618	2,715	5,333
6	8/2	to 8/15	1,785	3,303	5,088
7	8/16	to 8/29	1,398	1,328	2,726
8	8/30	to 9/12	1,523	1,526	3,049
9	9/13	to 9/26	1,257	1,138	2,395
10	9/27	to 10/10	2,202	1,346	3,548
11	10/11	to 10/24	919	242	1,161
12	10/25	to 11/7	1,154	695	1,849
13	11/9	to 11/30	428	128	556
Total			34,359	27,551	61,910

Table 2. Catch rates and % catch composition, Ririe Reservoir, 1986.

Year	Angler effort (hrs)	Catch composition (%)					Catch rate (fish/hr)
		Rainbow trout	Cutthroat trout	Brown trout	Coho salmon	Smallmouth bass	
1977	117,202	76	11	12	1	-	0.68
1978	133,923	59	16	2	23	-	0.58
1979	146,280	75	5	0.2	19	-	0.64
1982	137,017	71	1	0.2	28	-	0.58
1986	61,910	78	2	0.2	19	0.2	0.71

Table 3. Estimated return to creel of stocked fish, Ririe Reservoir, 1986.

Year	Stocked in 1986	Stocked in 1985	
	Rainbow trout catchables	Rainbow trout fingerlings	Coho salmon fingerlings
1982	37.4%	8.0%	14.5%
1986	29.0%	1.8%	10.2%

Table 4. Mean total length (mm) of fish harvested, Ririe Reservoir, 1986.

Year	Species			
	Rainbow trout	Cutthroat trout	Brown trout	Coho Salmon
1977	267	323	320	236
1978	277	325	338	251
1979	292	348	305	284
1982	287	358	315	251
1986	264	303	399	259

Table 5. Numbers of fish captured in spring gillnetting surveys, Ririe Reservoir, 1983 to 1986.

Location	Year	Species						
		Rainbow trout	Cutthroat trout	Brown trout	Coho salmon	Utah suckers	Utah chubs	Redside shiners
Across from Juniper	1983	14	1	1	0	52	24	0
	1984	0	0	1	0	14	0	0
	1985	0	0	0	0	85	0	0
	1986	0	0	0	0	7	0	0
Willow Creek Arm	1984	0	0	0	0	23	5	0
	1985	9	13	0	0	26	86	1
	1986	61	15	0	1	60	126	1
Meadow Creek Arm	1984	2	5	0	0	16	3	0
	1985	0	2	2	0	1	73	0
	1986	5	6	2	0	4	101	0
Dam	1986	1	0	0	10	0	5	0

### Mud Lake

Results from 29 net nights indicate that chubs and suckers are the dominant fish species in Mud Lake, although trap netting may not adequately sample the game species (Table 6). We captured 224 fish by electrofishing despite improperly working gear. The majority (56%) of the fish captured by electrofishing were yellow perch, ranging in total length from <50 mm to 170 mm (Fig. 1). Utah chubs (25%), brown bullheads (10%) and largemouth bass (8%) also were represented in the sample. The number of largemouth bass captured was insufficient to calculate PSD.

### Greens Pond

Snorkeling in Greens Pond revealed the presence of largemouth bass, bluegill and yellow perch. Further investigation indicated fish were stocked in Greens Pond during 1983 when it was mistaken for the Roberts gravel pond by a hatchery truck driver.

Several age classes of bass and bluegill indicated the occurrence of natural reproduction and overwintering. Presently, the owner does not allow trespassing, even though the pond is for sale. We will attempt to obtain an easement for fishing, or to obtain fish to stock in other waters.

### Roberts Gravel Pond

Two trips were made to Region 5 for fish. During June, both largemouth bass and bluegill were captured. A malfunction on the tank aerator resulted in the loss of all but 10 largemouth bass and 40 bluegill. On October 5, we transported 6 bass and 94 bluegill to Roberts gravel pond. Fish appeared to survive the transplant in good condition. An aerator for Roberts gravel pond was not installed until after winter; however, a mild winter with light snowfall made aeration unnecessary.

### Island Park Reservoir

As in recent years, Utah chubs and suckers comprised the majority of the fish captured by gill nets (Table 7). Rainbow trout were the most abundant game fish in the sample. A 275 mm cutthroat trout was also captured, the first one taken by gillnetting since 1966. Current species ratios suggest that nongame fish populations are near pre-treatment levels.

Table 6. Numbers of fish captured in trap netting survey, Mud Lake, 1986.

Location	Net nights	Species				
		Utah suckers	Utah chubs	Brown bullheads	Yellow perch	Largemouth bass
North Bay	6	75	90	6	1	2
Headquarters	7 <sup>a</sup>	3	12	8	2	0
Camas Creek	7	3	2	0	0	0
S. Boat Launch	<u>9</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	29	81	104	14	3	2

<sup>a</sup>Windy location; nets not fishing well.



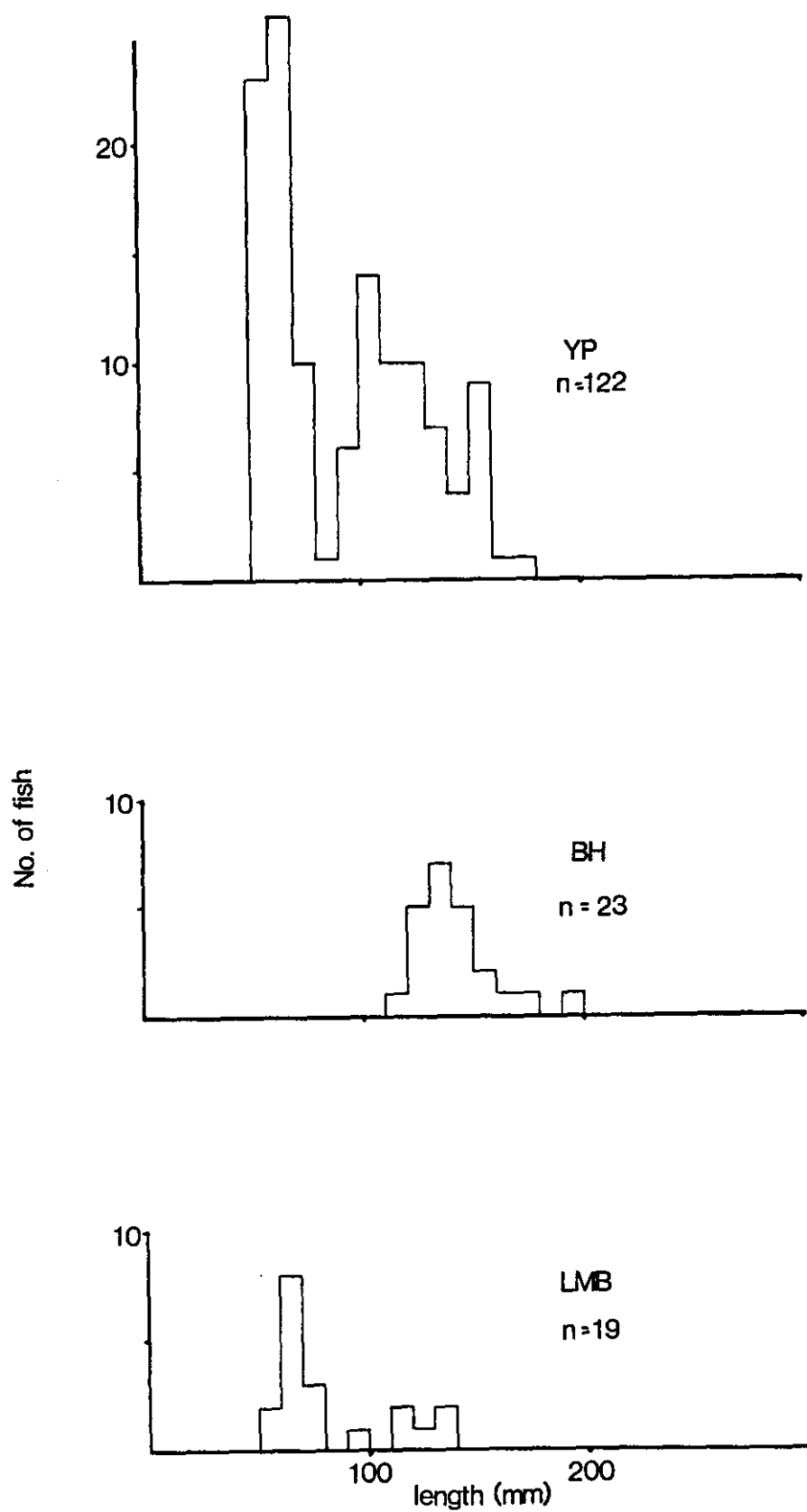


Figure 1. Length frequencies of game species captured by electrofishing in Mud Lake, 1986.

Table 7. Numbers of fish captured in gill net surveys, Island Park Reservoir, 1976 to 1986.

Year	Number of net nights	Species								
		Wild rainbow trout	Rainbow trout fingerlings	Hatchery rainbow catchables	Brook trout	Coho salmon	Cutthroat trout	White- fish	Utah chubs	Utah suckers
1976	2	11	-	-	3	8	-	-	68	67
1978	1	5	-	-	1	-	-	4	87	82
1980	2	21	-	-	-	-	-	-	2	4
1984	3	10	-	5	4	5	-	3	21	10
1986	3	13	15	2	1	4	1	5	83	102

### Henrys Lake Cofferdam

Additional work on the cofferdam--funded by Henrys Lake Foundation and the IDFG--allowed the lake to remain 0.6 m deeper throughout winter. Two benefits were derived from this: (1) the lake did not winter-kill, a distinct possibility at reduced lake levels; and (2) due to low precipitation this past winter, maintaining a higher water level allowed the lake to fill this spring despite low runoff.

### Boyles Oxbow

No fish were captured in either gill nets or trap nets in Boyles oxbow. (We did capture two painted turtles.) Several small fish, possibly shiners, were observed. The lake appears to be suitable for warmwater species introductions.

### Sand Creek WMA

Anglers fished an estimated 13,599 hours from May 24 to September 12, 1986, at five ponds on Sand Creek Wildlife Management Area (WMA). Anglers harvested an estimated 7,677 trout, including hatchery rainbow catchables (31.3%), hatchery rainbow fingerlings (49.6%) and wild and hatchery brook trout (19%) (Table 8). Overall catch rate was 0.63 fish/hr; overall harvest rate was 0.56 fish/hr. Anglers predominately used bait (82%), followed by flies (7%), lures (5%) and combined gear (6%).

The largest reservoir on Sand Creek (32 hectares), Pond 4, supported the greatest angler effort (6,289 hours) and harvest (2,830 trout) of the five ponds censused in 1986. Effort and fish harvested decreased in Pond 4 in 1986 when compared to 1981 (Ball et al. 1982). Catch rates were fairly constant during the three years' census (Table 9).

Pond 3 had the lowest angler effort (1,380 hours) and harvest (604 trout) of all ponds surveyed despite being the second largest impoundment (16 hectares). Pond 3 also showed a decline in harvest and angler effort from past seasons. A catch rate of 0.44 fish/hr was intermediate between 1979 and 1981 observations (Table 9).

Pond 2 also had a decline in angler effort from prior years. However, due to a high catch rate of 1.00 fish/hr, total harvest was nearly equal to 1981. Catch rate for 1986 was twice as high as observed in 1979 and 1981 (Table 9).

Pond 1 was the only pond censused in 1986 where angler use increased; estimated angler effort increased from 1,507 hours in 1981 to 1,984 hours in 1986. The 1986 total harvest (752 trout) was nearly identical to 1979 and 1981. Pond 2 had the lowest catch rate of all ponds in 1986 and was the only pond that exhibited a decline in catch rate compared to 1981.

Table 8. Creel census summary at Sand Creek WMA (by pond), May 24 to September 12, 1986.

Water	Surface area (hectares)	Angler effort (hrs)	Fish harvested		Brook trout	Total	Trout/ hr	Trout/ hectare	Effort/ hectare
			CRB <sup>a</sup>	FRB <sup>b</sup>					
Blue Creek Reservoir	3.2	1,764			1,309	1,309	0.74	404.9	545.7
Pond 1	6.5	1,984	258	462	32	752	0.38	116.0	306.2
Pond 2	7.3	2,182	661	1,521	-	2,182	1.00	278.8	298.8
Pond 3	15.8	1,380	241	363	-	604	0.44	37.0	86.4
Pond 4	31.6	6,289	1,245	1,459	126	2,830	0.45	88.9	200.0
Totals	64.4	13,599	2,405	3,805	1,467	7,677	0.56	118.5	212.4

<sup>a</sup>CRB = catchable rainbow trout from hatchery releases.

<sup>b</sup>FRB = fingerling rainbow trout from hatchery releases.

Table 9. Comparison of estimated angler effort, harvest and catch rates.  
Management Area, 1979, 1981 and 1986.

Sand Creek Wildlife

Water	Angler effort (hr)			Fish harvested			Catch rate (trout/hr)		
	1979	1981	1986 <sup>a</sup>	1979	1981	1986 <sup>a</sup>	1979	1981	1986
Blue Creek Reservoir	3,915	3,743	1,764	1,857	2,442	1,309	0.47	0.64	0.74
Pond 1	2,154	1,507	1,984	787	727	752	0.37	0.48	0.38
Pond 2	6,178	4,193	2,182	3,068	2,172	2,182	0.50	0.52	1.00
Pond 3	5,494	2,901	1,380	3,119	1,082	604	0.57	0.37	0.44
Pond 4	14,450	9,180	6,289	7,031	3,659	2,830	0.49	0.40	0.45
Total	32,191	21,524	13,599	15,862	10,082	7,677	0.49	0.47	0.56

<sup>a</sup>Effort and harvest after Labor Day estimated using proportion of effort and harvest occurring after Labor Day in 1979 and 1981.

Blue Creek Reservoir is the smallest of five impoundments at Sand Creek. With a total of 1,764 hours of angler effort, 1,309 trout were harvested at a catch rate of 0.74 fish/hr. Angler effort and harvest declined from 1979 and 1981, although catch rates were much higher. The Blue Creek Reservoir fishery was comprised of 100% wild brook trout. The release of hatchery rainbow and brook trout into the reservoir was discontinued in 1984. The high catch rate sustained by wild brook trout was a significant change from past years.

Ponds 2 and 4 had the highest return to the creel of stocked fish (Table 10). Mean size of fish harvested showed little variation among the 4 ponds annually stocked; but Blue Creek Reservoir, which is supported by a wild brook trout population, produced smaller fish (Table 11).

Idaho residents, primarily from Fremont, Madison and Bonneville (surrounding) counties, comprised 88% of the anglers interviewed at Sand Creek ponds during 1986. No residents traveled more than 160 km to fish at Sand Creek WMA. The proportion of nonresident anglers, primarily from Arizona, increased from 7.4% in 1981 to 12% in 1986.

Questionnaire results indicated 60% of the anglers rated the fishery as good to excellent, but 74% either felt the fishery had not improved or had declined. Most anglers (59%) favored the concept of special regulations to improve the fishery, but were not interested in restricting bait or gear.

Table 10. Percent return to creel of hatchery fish stocked into Sand Creek Wildlife Management Area ponds, 1986.

Water	Species		Brook trout
	Rainbow fingerlings	Rainbow catchables	
Pond 1	2.3%	5.7%	0.2%
Pond 2	15.0%	31.4%	0.0%
Pond 3	3.6%	12.0%	0.0%
Pond 4	14.4%	27.6%	0.6%

Table 11. Mean length (mm) of fish harvested from the Sand Creek Wildlife Management Area ponds, 1986.

Water	Species		Brook trout
	Rainbow fingerlings	Rainbow catchables	
Pond 1	275	271	248
Pond 2	283	255	-
Pond 3	248	263	263
Pond 4	276	274	270
Blue Creek Reservoir	-	-	220

## **ACKNOWLEDGMENTS**

Thanks go to Tanna Ragan, Bill Harryman, Robert Warren, and Kurtis Plaster, bio-aides, for their assistance in the field and with data preparation. Thanks also to the conservation officers from the Ashton and Idaho Falls districts for field assistance. Personnel from Ashton and Mackay hatcheries provided assistance at Henrys Lake Outlet. Mary Hoyt of the Department of Transportation and Tim Bozorth of the Bureau of Land Management also assisted with field work. Kelly McLeod assisted with graphics.

## LITERATURE CITED

- Ball, K., V. Moore, and J. Curran. 1982. Regional Fishery Management Investigations. Federal Aid to Fish and Wildlife Restoration. Job Performance Report. Project F-71-R-6. Idaho Department of Fish and Game. 73 pp.
- Corsi, C. and S. Elle. 1986. Regional Fishery Management Investigations. Federal Aid in Fish Restoration. Job Performance Report. Project F-71-R-10. Idaho Department of Fish and Game. 51 pp.
- Moore, V., M. Reingold, C. Corsi, J. Curran, B. Penske, E. Jochum, and B. Sellers. 1983. Regional Fishery Management Investigations. Job Performance Report. Project F-71-R-6. Idaho Department of Fish and Game. 108 pp.



## JOB PERFORMANCE REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT  
INVESTIGATIONS

Project No.: F-71-R-11

Job No.: 6(IF)-c<sup>1</sup>

Title: Region 6 (Idaho Falls) Rivers  
and Streams Investigations

Period Covered: July 1, 1986 to June 30, 1987

### ABSTRACT

Electrofishing and angling surveys on the South Fork Snake River indicated that since protected by special regulations, the wild cutthroat trout population has shown increases in density and mean length and a decrease in mortality. The percentage of cutthroat trout >405 mm in length has increased from 1.9% in 1982 to 9.1% in 1986. Estimated brown trout densities also showed a slight increase, but their percent composition of the total trout population declined, a direct result of increasing numbers of cutthroat trout present. A total of 809 brown trout redds were counted in 1986, an increase from 608 in 1985, indicating an increasing brown trout population riverwide.

Additional fish passage on Pritchard Creek was provided in 1986 through a cooperative effort with Trout Unlimited, Bureau of Land Management (BLM), U.S. Forest Service (USFS), the landowner and IDFG. Spawning fish from South Fork Snake River now have access to an additional 7 km of stream. Fish passage structures on lower Pritchard Creek, supplied by the Idaho Department of Transportation, now provide fish access to additional spawning and rearing habitat.

In cooperation with Trout Unlimited and the Bingham County Road and Bridge Department, a gabion structure at Mill Creek was completed to provide fish passage through the Mill Creek culvert.

Population work conducted on Sawmill and Summit creeks in the Little Lost River drainage indicated that grazing enclosures permit excellent habitat for fish on Summit Creek, but that little improvement has yet occurred on Sawmill Creek. High flows in Sawmill Creek have resulted in stream channel alterations, which are slowing the habitat improvement process.

An estimated 3,096 trout were isolated in Egin Canal as a result of the canal being shut off for the winter months. Fish not caught by angling prior to freeze-up are presumed to be lost.

An estimated 24,000 cutthroat trout and hybrids were salvaged at Henrys Lake Outlet and distributed to other regional waters in 1986. Fall sampling indicated that cutthroat and brook trout exist in resident populations in Henrys Lake Outlet, but rainbow trout may be migratory.

Fish populations in Twin Creek, a tributary to Henrys Lake Outlet, are comprised of resident brook trout and primarily juvenile cutthroat and rainbow trout.

During December 1986, an angle-iron fish ladder was placed in the Targhee Creek culvert to provide fish passage. Estimated cost of the project was less than \$500.

Authors:

Steve Elie  
Regional Fishery Manager

Chip Corsi  
Regional Fishery Biologist

## OBJECTIVES

1. To evaluate early response of the cutthroat trout population to special regulations on the South Fork Snake River.
2. To assess the brown trout *spawning* trend in South Fork Snake River.
3. To provide fish passage on road culverts and irrigation diversions that currently block *spawning* runs.
4. To assess fishery response to grazing exclosures in the Little Lost River drainage.
5. To assess fish losses due to irrigation and power production in Egin Canal.
6. To salvage excess fish from Henrys Lake Outlet to provide additional angling opportunity in other waters. To begin assessment of resident fish populations in Henrys Lake Outlet.
7. To assess Twin Creek fish populations where *mining* has been proposed.

## RECOMMENDATIONS

1. Evaluate the long-term response of the cutthroat trout population to special regulations on South Fork Snake River. Evaluate the trend in the fishery in areas under general regulations for comparison.
2. Assess angler opinions and attitudes toward special regulations on South Fork Snake River.
3. Assess the apparent increase in numbers of brown trout spawners and determine if an additional harvest is allowable.
4. *Continue* salvage efforts in the Palisades Dam afterbay as necessary.
5. Assess utilization of Pritchard Creek by cutthroat trout spawners.
6. *Continue* the Sawmill Creek grazing exclosure evaluations. Obtain additional *information* regarding bull trout in the Little Lost River drainage.
7. Require *screening*, or other methods of deterring fish from entering Egin Canal, as part of the Ashton-St. *Anthony* hydro license requirement.
8. *Continue* salvage efforts at Henrys Lake Outlet as necessary. Obtain additional *information* on resident fish populations in Henrys Lake Outlet.
9. Assess utilization of Targhee Creek upstream from the road culvert by cutthroat and brook trout spawners.

## TECHNIQUES

### South Fork Snake River

Trout populations in South Fork Snake River were monitored using electrofishing, angling and aerial redd surveys (brown trout) during 1986. Using a jet boat with boom-mounted anodes, electrofishing was conducted on a 4.8 km river reach from Swan Valley Bridge downstream to the Granite Creek area (Conant Valley), the same section sampled in 1982 prior to the implementation of special regulations (Moore and Schill 1984). In 1986, we conducted a Schnabel estimate (similar to the procedure used in 1982) based on the first four days of capture and marking (November 4 to 7). A fifth run was made on November 20, which enabled us to do a Peterson estimate, using fish marked during the initial four days as our marked sample. For the Peterson method, fish were divided into size groups based on sampling efficiency. Fish of all sizes were used for the Schnabel estimate in order to duplicate methods used by Moore and Schill.

Shore and drift boat test angling by Department personnel was conducted on September 12 and 13, using artificial flies and lures. Fish caught were identified by species and measured to the nearest millimeter before release. Lengths of captured fish were compared to those checked in angler creels during 1982.

The annual brown trout spawning survey was conducted by air from Palisades Dam downstream to the mouth of Henrys Fork on December 5. Counts were compared to previous years' data to continue to establish trend data on brown trout spawning.

With the aid of backpack electrofishing units, we salvaged trout from the Palisades Dam stilling basin on October 10 during repair operations by the Bureau of Reclamation. Salvaged fish were placed downstream in the afterbay.

### Pritchard Creek

To assess utilization of restructured stream habitat, electrofishing was conducted on March 20 in Pritchard Creek in the area of the old highway bridge to the riprap area upstream from the new bridge. Fish were identified and measured. However, high, turbid water prevented completion of a population estimate.

On June 20 and 21, we worked on a cooperative project with Trout Unlimited, USFS, BLM and the local landowner to establish fish passage around the irrigation diversion on Pritchard Creek. We also salvaged trout from the old stream channel following the diversion of water into the fish passage section.

### Mill Creek

Gabion baskets and fill material were acquired from the Bingham County Road and Bridge Department for the purpose of constructing a gabion to back water into the Mill Creek culvert. Presently, fish passage is blocked by a drop of approximately 0.5 m and by a long, high-velocity barrier in the culvert.

### Little Lost River Drainage

Electrofishing was conducted at four sites on Sawmill Creek and three sites on Summit Creek during July 1986. Population estimates were made using either the two-pass or three-pass method. Site selection on Sawmill Creek coincided with previous years' work (Corsi and Elie 1986), except Section 2 was moved approximately 200 m upstream due to a change in the stream channel. Section 3 had been altered by high flows. One new section was added on Summit Creek to assess the change in the fishery following the creation of a new grazing exclosure by the BLM. The other two sections were the same as those sampled in 1984 (Corsi et al. 1986).

### Egin Canal

We electrofished three sections of Egin Canal on December 1, shortly after water into the irrigation system was shut off for the winter. For the purpose of estimating the total number of trout lost in the canal, we used the two-pass method. Three sections were sampled: (1) near the headgate, (2) 1.6 km upstream from Parker, and (3) at Parker. All trout captured were transported and released in the Henrys Fork.

### Henrys Lake Outlet

Salvage operations were conducted in Henrys Lake Outlet during May 28 and 29. All fish were collected within 100 m of the dam using a seine. Captured fish were placed in hatchery trucks and transported to other waters for release.

Four sections of Henrys Lake Outlet, totaling 477 m in length, were electrofished on October 6 in order to assess species composition and size structure of fish populations. One pass was made through each section using a backpack electrofishing unit.

### Twin Creek

On October 29, population estimates were conducted at two sites on Twin Creek with a backpack shocker using the two-pass method. Section 1, measuring 105 m in length, was located approximately 1.5 km upstream from the Meadow Creek road crossing on Twin Creek. Section 1 lies within a forest. Streambanks are stable, the riparian zone is healthy and instream log habitat is common. Section 2 measured 71 m in length. Located immediately downstream from Meadow Creek road, Section 2 lies in a heavily grazed pasture and thus, streambank stability and cover are poor.

### Targhee Creek

Measurements were made on the Targhee Creek culvert to determine the procedures necessary to provide fish passage. An angle-iron ladder, placed on a tributary to the Yellowstone River by the Montana Department of Fish, Wildlife and Parks, was inspected during October for design ideas.

## **FINDINGS**

### South Fork Snake

#### River Population Estimates

A total of 1,985 trout were captured at least once during the five days of electrofishing. Species composition included wild cutthroat trout (84%), brown trout (13%), rainbow trout and hybrids (2%) and lake and hatchery cutthroat trout (<1% each). Wild cutthroat trout were the only species that showed an increase in percent composition over the 1982 data (Fig. 1).

A wider size range of fish was collected in 1986 than in 1982. Wild cutthroat trout ranged from 80 mm to 509 mm in length in 1986, compared with 190 mm to 449 mm in 1982 (Fig. 2). Brown trout lengths ranged from 90 mm to 640 mm in 1986 compared with 170 mm to 504 mm in 1982 (Fig. 3).

For purposes of comparison with 1982 data, the Schnabel population estimate and fish size parameters were calculated for fish over 170 mm in length during 1986. The Peterson estimate was calculated based on capture efficiency of different size groups and included fish 250 mm in length or larger.

Using the Schnabel estimate, trout density (all species) in the Conant Valley section during 1986 was 169.2/hectare, an increase from 102.7/hectare in 1982. This can be attributed almost entirely to an

# SPECIES COMPOSITION SOUTH FORK SNAKE RIVER

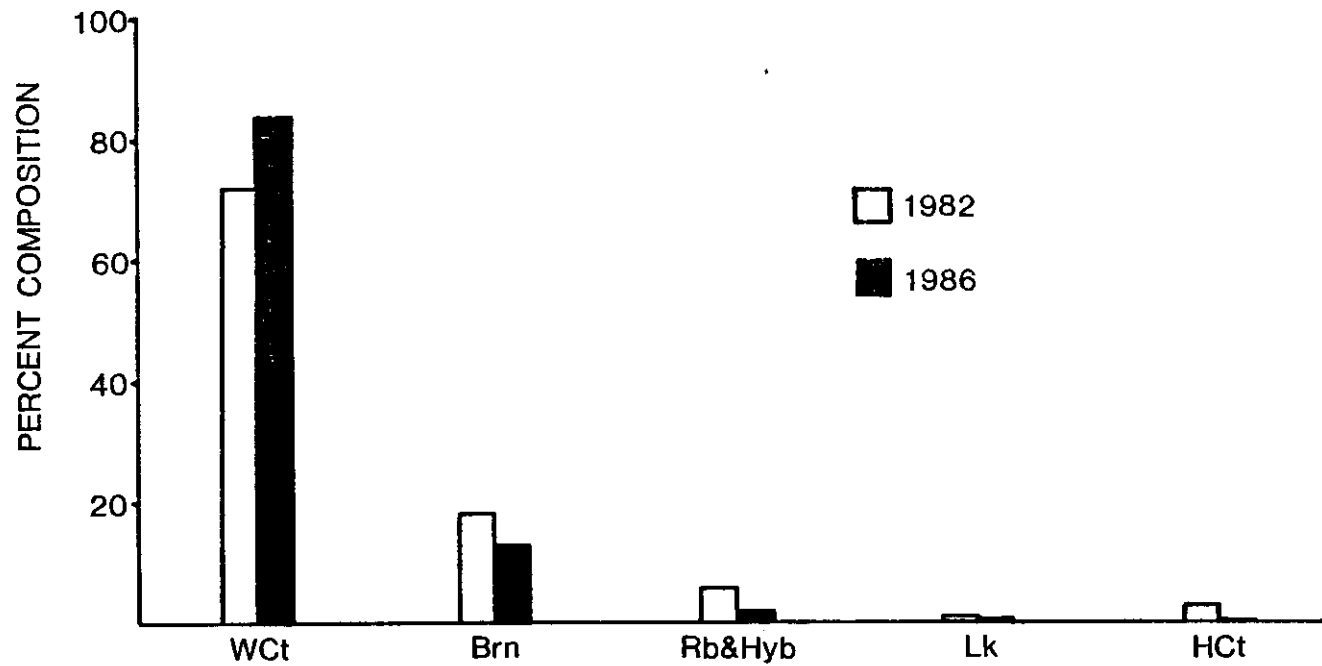


Figure 1. Species composition of fish captured by electrofishing in the Conant Valley reach of the South Fork Snake River, 1986.

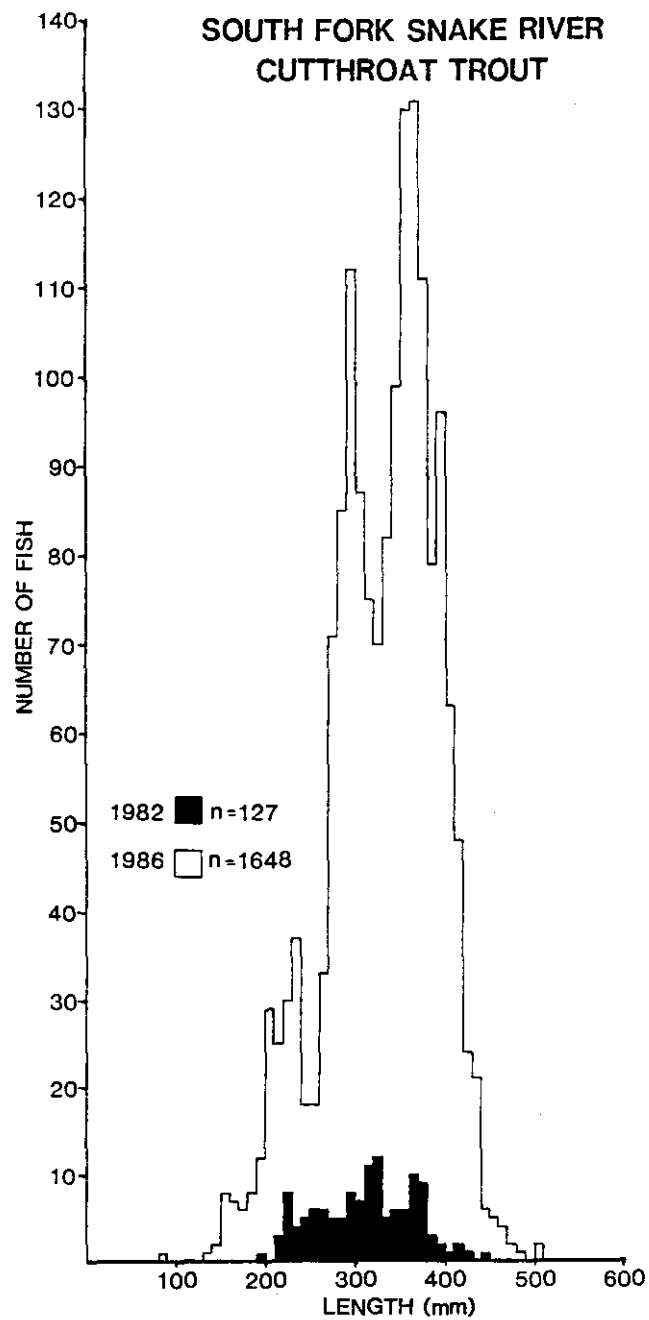


Figure 2. Length frequency distribution of cutthroat trout captured by electrofishing in the Conant Valley reach of the South Fork Snake River, 1986.



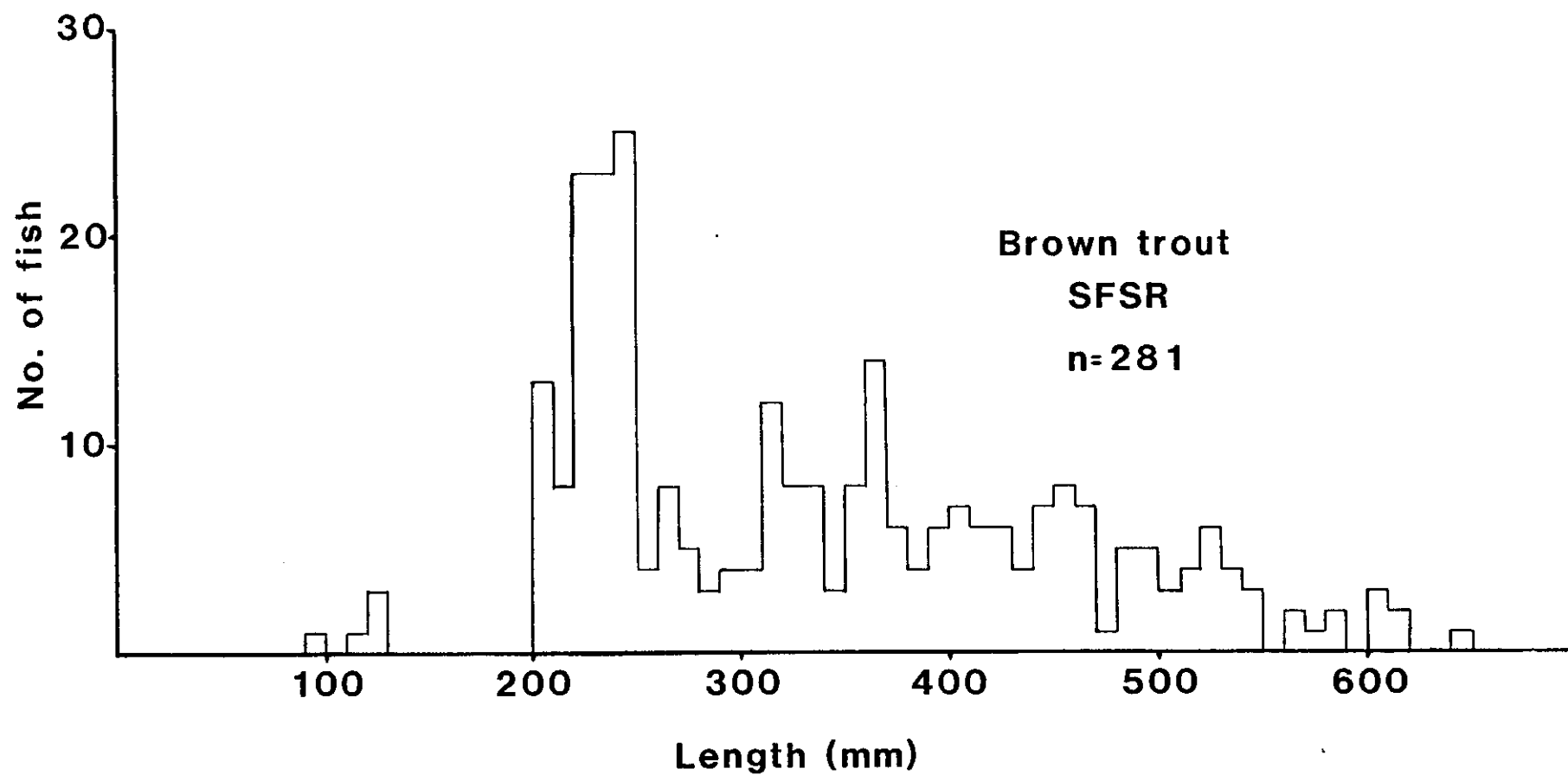


Figure 3. Length frequency distribution of brown trout captured by electrofishing in the Conant Valley reach of the South Fork Snake River, 1986.

increased slightly (Fig. 4). The Peterson estimate for wild cutthroat trout was 198.1/hectare. The Peterson method probably gives better results than the Schnabel method because the assumption that marked and unmarked fish have equal catchability is less likely to be violated when fish are given one to two weeks to disperse after marking (Vincent 1971). The Peterson method will be used for future comparisons.

Mean length of wild cutthroat trout also increased substantially from 311 mm in 1982 to 334 mm in 1986 (Fig. 5). The percentage of wild cutthroat >405 mm increased from 1.9% in 1982 to 9.1% in 1986. Management goals call for 20% of the fish to be >405 mm.

Using length-age distribution as described by Moore and Schill (1984), fish were assigned to different age classes and a catch curve was constructed (Fig. 6). The steep descending limb, which indicates ages at which the rate of mortality is highest, has shifted one age class to the right. Slope also has decreased, indicating much higher survival in older age classes (Table 1).

## Angling

Department personnel expended 69 hours of fishing effort from drift boats and the bank during the September sampling. A total of 145 trout (82% cutthroat, 17% brown and 1% RB x CT hybrids) were captured for a catch rate of 2.1 fish/hr. Catch rates in September 1982 (bank and drift boat) for the same reach were 1.34 fish/hr (Moore and Schill 1984).

In order to compare lengths of wild cutthroat caught in 1986 with lengths from angler creels in 1982, we compared our length frequencies with that of Moore and Schill (1984). Fish <150 mm in length were considered as fish that would be released by 100% of the anglers. Lengths ranging from 150 mm to 250 mm were assumed to have been released 70% of the time based on percent occurrence in the 1982 creel data (Moore and Schill 1984). All fish >250 mm were considered as "keepers" for length analysis. Corsi et al. (1986) found that most South Fork Snake River anglers considered fish <250 mm unacceptable for harvest. Thus, the average size of "keeper" fish caught in 1986 was 339.5 mm, compared with 318 mm in 1982. However, only 2.5% of the keepers landed in 1986 were >405 mm. Nearly 3.8% of the fish checked in 1982 were >405 mm.

## Redd surveys

We counted 809 brown trout redds during the 1986 survey, an increase of 201 redds over the 1985 count (Table 2). Brown trout continue to use specific reaches more heavily than others; Palisades Dam afterbay was the most intensively used area. The section from Conant Valley to Burns Creek showed the greatest increase in spawner utilization, with 311 redds observed in 1986 compared with 143 in 1985 (Table 3). Low flows from Palisades Dam during the winter of 1986 to 1987 resulted in dewatering of some side channels in the canyon and probably resulted in the loss of some brown trout spawners in that area. The overall trend in numbers of redds counted since 1983 shows a sharp increase, further evidence that brown trout numbers are increasing throughout the river (Fig. 7).

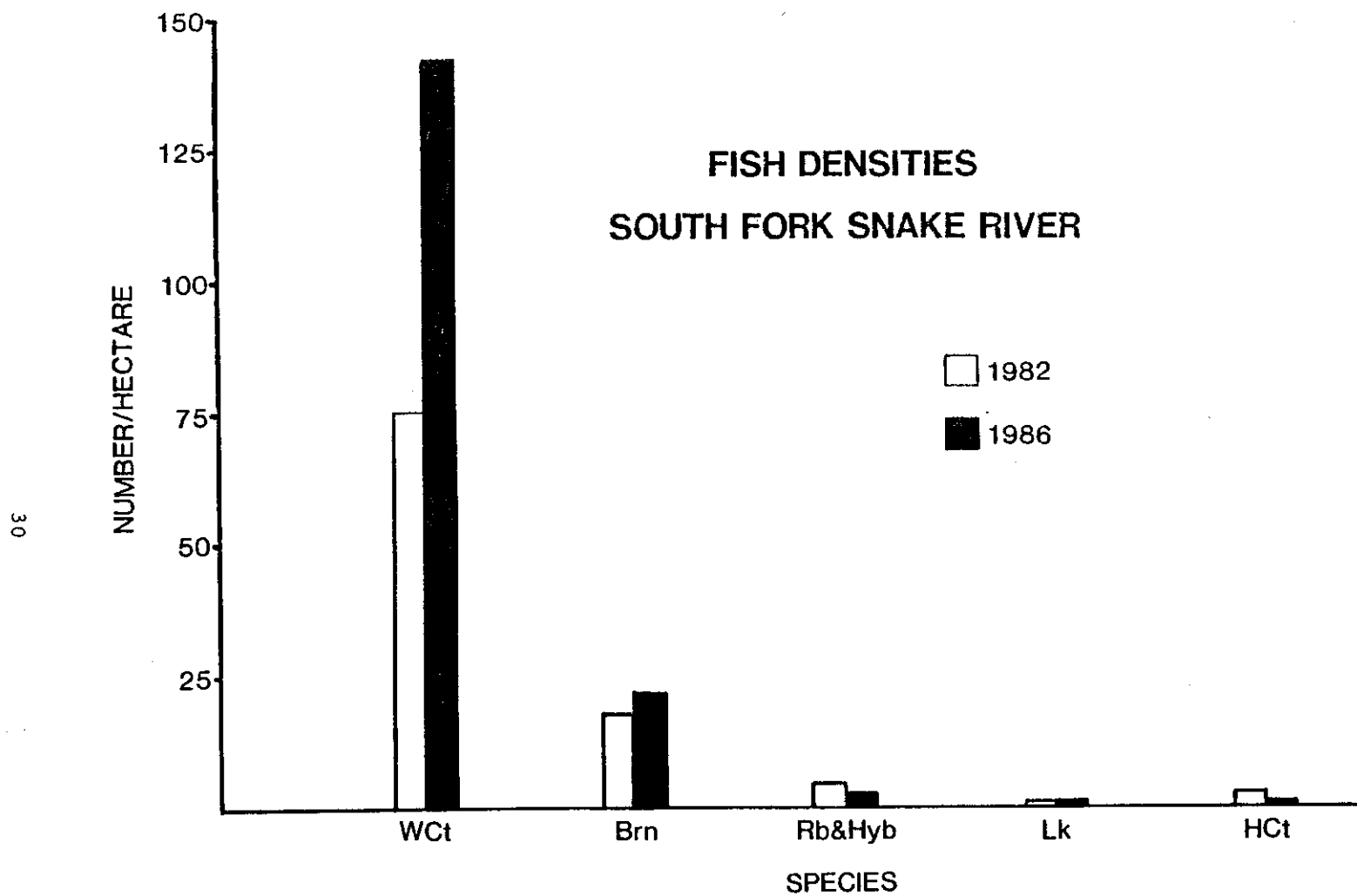
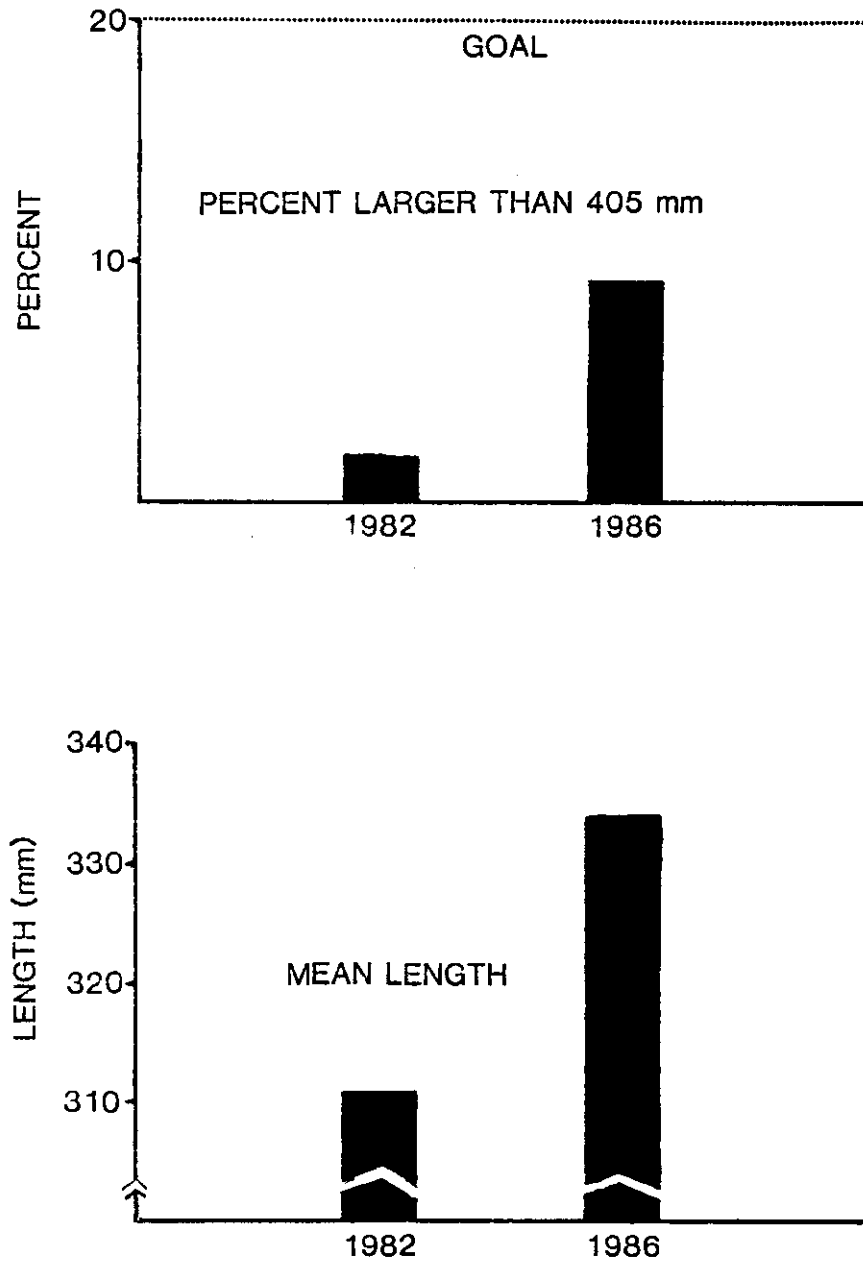


Figure 4. Fish population density estimates in the Conant Valley reach of the South Fork Snake River, 1986.



**CUTTHROAT TROUT**  
**SOUTH FORK SNAKE RIVER**

Figure 5. Comparison of mean length and percentage of fish >405 mm in the cutthroat trout population of the South Fork Snake River, 1982 and 1986.

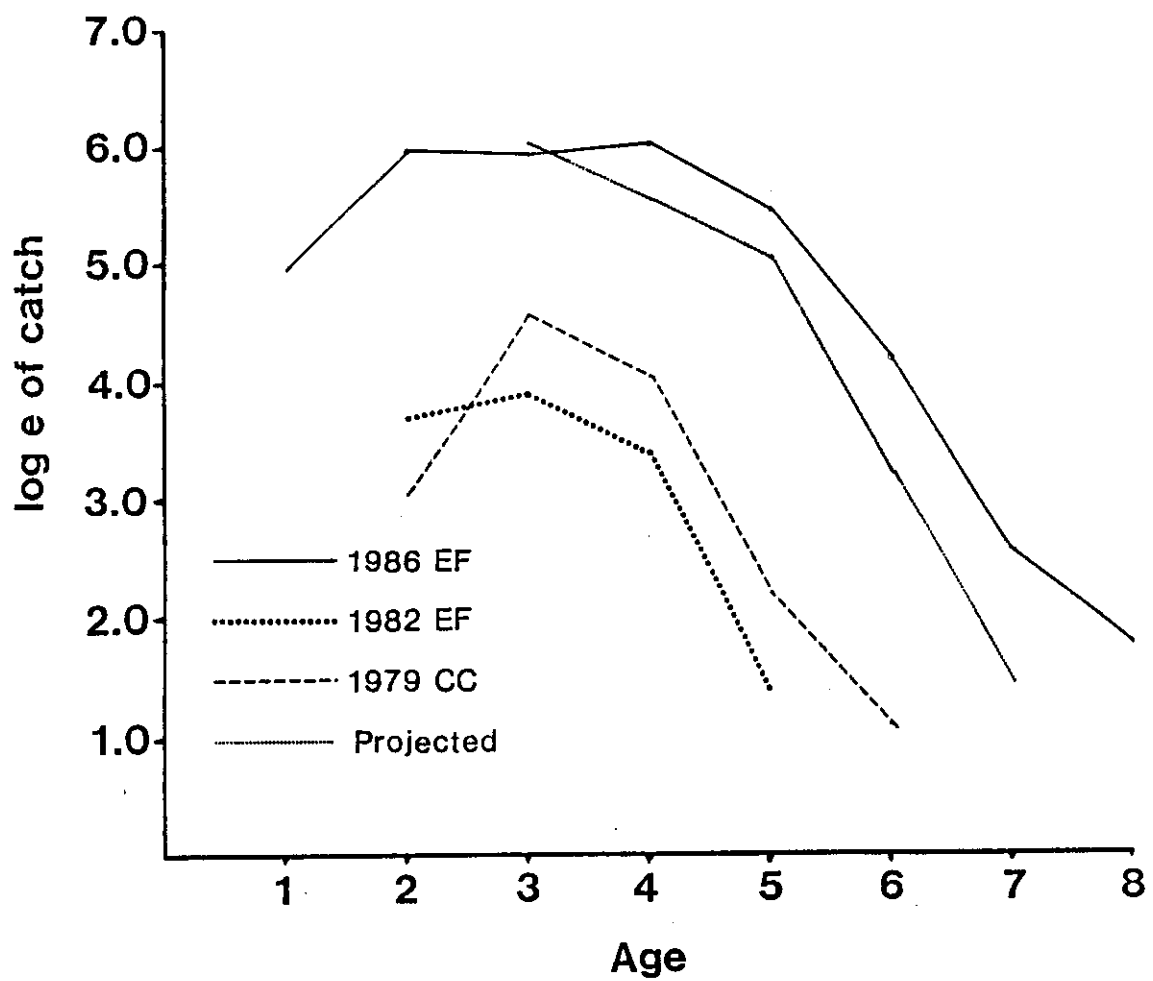


Figure 6. Catch curve for the wild cutthroat trout population of the South Fork Snake River special regulations area, 1986.

Table 1. Catch data by age and mortality coefficients (Z, A and S) for South Fork Snake River cutthroat trout in the Conant Valley area, 1986.

	Age classes							
	1	2	3	4	5	6	7	8
Catch	140	396	377	410	231	66	13	6
ln	4.94	5.98	5.93	6.01	5.44	4.19	2.56	1.79
		Z		A		S		
Ages 4-8		1.13		0.68		0.32		
Ages 4-5		0.57		0.43		0.57		
Ages 5-6		1.25		0.71		0.29		

Table 2. Brown trout redd counts on the South Fork Snake River, 1979 to present.

Reach	Distance (km)	Dates							
		Dec. 11 1979	Dec. 16 1980	Dec. 4 1981	Dec. 8 1982	Dec. 20 <sup>a</sup> 1983	Dec. 4 1984	Dec. 10 1985	Dec. 5 1986
Afterbay of Palisades Dam	0.8	50	61	69	90	49	75	179	294
Afterbay to Irwin	11.2	0	0	0	0	0	51	143	29
Irwin to Conant Valley	15.8	6	45	7	4	4	8	65	46
Conant Valley to Burns Creek	16.2	89	104	95	120	96	37	143	311
Burns Creek to Anderson Diversion	20.6	14	23	0	57	9	51	8	62
Anderson Diversion to Heise Bridge	5.6	4	0	0	0	0	7	5	0
Heise Bridge to mouth	<u>30.4</u>		14	26	21	NC	NC	23	65
67 Total	100.6	177	259	192	271	158	252	608	809

<sup>a</sup>Counts should be considered low due to poor visibility resulting from fog.

## Salvage

A total of 427 brown trout, 26 cutthroat trout, 33 lake trout, 1 hybrid and 1 rainbow trout were salvaged from the stilling basin. Total lengths of brown trout ranged from 232 mm to 730 mm. Of the 142 brown trout measured (and checked for sex), 5 ranged from 200 mm to 299 mm, 41 ranged from 300 mm to 399 mm and 44 ranged from 400 mm to 499 mm. No fish <300 mm were mature. Twenty percent of brown trout in the 300 mm to **399** mm size range were mature and **66%** in the 400 mm to 499 mm size range were mature. All fish >500 mm (n=52) were mature.

Sixty-two percent of cutthroat trout captured were hatchery fish from Palisades Reservoir. All cutthroat measured ranged from 300 mm to 400 mm in length. Lake trout were all in the 300 mm to 500 mm size range.

## Pritchard Creek

Electrofishing in lower Pritchard Creek resulted in the capture of 53 cutthroat trout, 33 brown trout and 84 whitefish. Cutthroat ranging in length from 70 mm to 245 mm were all identified as juveniles. All brown trout ranging from 85 mm to 195 mm also were juveniles. Whitefish were not measured, but all were assumed to be age 1+ fish. Based on the number of fish captured in rehabilitated stream areas, including inside the culvert, apparently the area is well utilized by juvenile fish.

Fish passage was provided around the old irrigation diversion on Pritchard Creek using steps made of top-notched concrete cattle guard base sections to concentrate flow. Streambanks were riprapped for stability. Along with providing fish passage, rearing habitat, similar to that at the highway, is now in place. Habitat utilization will be assessed in the future.

As water was turned out of the old channel and into the new one, we salvaged a number of cutthroat trout spawners from the dewatered area. These spawners, which appeared to be main stem South Fork Snake River cutthroat, were placed in the rehabilitated channel. Fish were either green or ripe and presumably spawned in Pritchard Creek.

## Mill Creek

A 1.4-m-high gabion was constructed around the mouth of the Mill Creek culvert during September with help from club members of Idaho Falls Trout Unlimited. The gabion was constructed in a "horseshoe" shape with a 0.9-m jump in the northeastern corner. Interstitial spaces in the gabion are expected to fill as high water deposits silt and debris; however, this process may be delayed due to low runoff in 1987. Hardware cloth may be used to increase the rate of deposition and filling.



Table 3. Electrofishing results from Sawmill Creek, 1984 to 1886.

Sampling location	Date	Section length	Estimate (95% CI)	Density (trout/100 m <sup>2</sup> )	Trout species composition (no. of fish)			Comments
					Bull	Rainbow	Brook	
Sawmill No. 1	10/84	103 m	42(+14)	41	6	26	4	
	7/85	103 m	27(+03)	26	11	13	3	
	7/86	112 m	25(+02)	22	4	18	3	
Sawmill No. 2	10/84	75 m	15(+05)	20	1	12	2	New section at 200 m upstream from old site.
	7/85	75 m	16(+05)	21	6	8	2	
	7/86	120 m	22(+02)	18	8	11	3	
Sawmill No. 3	10/84	61 m	17(+02)	28	5	10	2	Stream channel moved laterally at 4 m. Stakes washed out.
	7/85	61 m	09(- )	15	2	2	5	
	7/86	92 m	11(+02)	12	2	7	2	
Sawmill No. 4	10/84	75 m	03(- )	4	1	2	0	
	7/85	75 m	03(- )	4	0	3	0	
	7/86	10 m	22(+06)	22	5	16	1	

Brown Trout Spawning Surveys  
South Fork Snake River

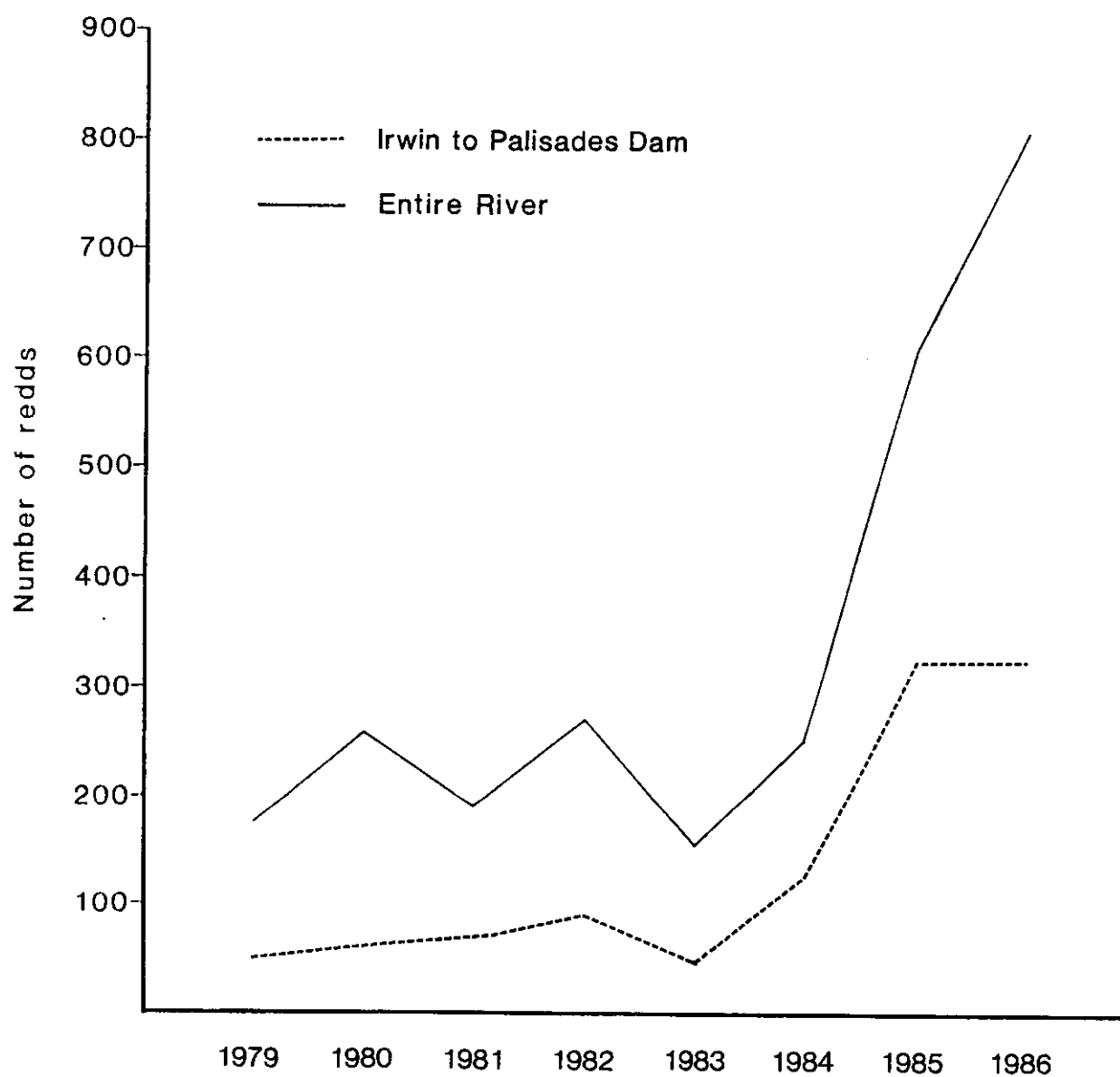


Figure 7. Trend in brown trout redd counts, South Fork Snake River, from 1979 to 1986.

## Little Lost River Drainage

Fish densities in Sawmill Creek were lower in 1986 than in 1985, with the exception of Section 4 where the number of fish increased markedly (Table 3). High flows and an unstable stream channel upstream from the habitat improvement areas have probably caused significant channel changes; and improvements are occurring more slowly than anticipated.

Lengths of fish from Sawmill Creek ranged from 125 mm to 325 mm for bull trout, 70 mm to 220 mm for brook trout and 80 mm to 310 mm for rainbow trout (Fig. 8).

Fish densities in Summit Creek are much higher than in Sawmill Creek. In Section 3, which measured 89 m, an estimated 148 (+12, 95% CI) age 1+ and older fish were present, a density of 166 fish/100 m<sup>2</sup>. The other section also appeared to have high densities of fish, indicating that grazing exclosures are effective on Summit Creek. Maximum lengths of rainbow and brook trout captured were 264 mm and 254 mm, respectively, with numerous fry of both species present (Fig. 9).

## Egin Canal

We captured trout in the two upper sections, but not in the lower section near Parker. In the upper section, which encompassed 329.2 m immediately downstream from the headgate, an estimated 285 (+26, 95% CI) trout were present. Species composition was 97% wild rainbow, 2% brown trout and 1% brook trout. Trout were grouped into three size categories: (1) <150 mm (612), (2) 150 mm to 300 mm (30%), and (3) >300 mm (8%). The largest fish measured was a 444-mm long wild rainbow trout.

In the middle section (129.5 m long), an estimated 54 (+3, 95% CI) trout were present. All were wild rainbow, with 62% <150 mm, 26% between 150 mm and 300 mm and 11% >300 mm.

No trout were captured in the lower section near Parker. Whitefish were present in all sections sampled.

In order to estimate the total number of trout lost to the canal, estimated densities of fish for each of the upper two sections were averaged and then multiplied by canal length from the headgate to the downstream boundary of the middle section. Average density calculated was 645 trout/km over a length of approximately 4.6 km. Therefore, an estimated 3,096 trout were lost to the canal.

Sawmill Creek

July 1986

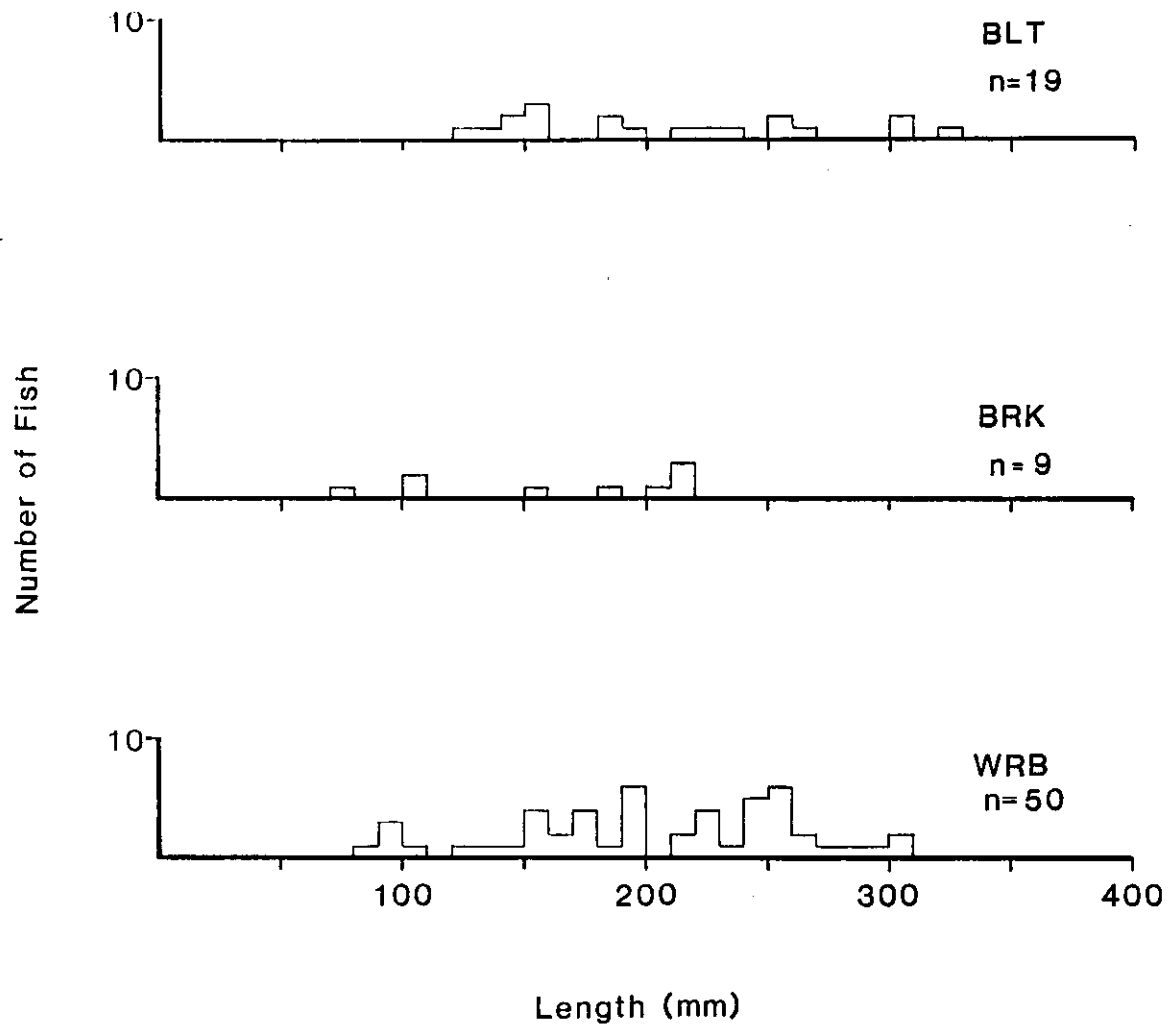


Figure 8. Length frequency distribution of fish captured in Sawmill Creek during 1986.

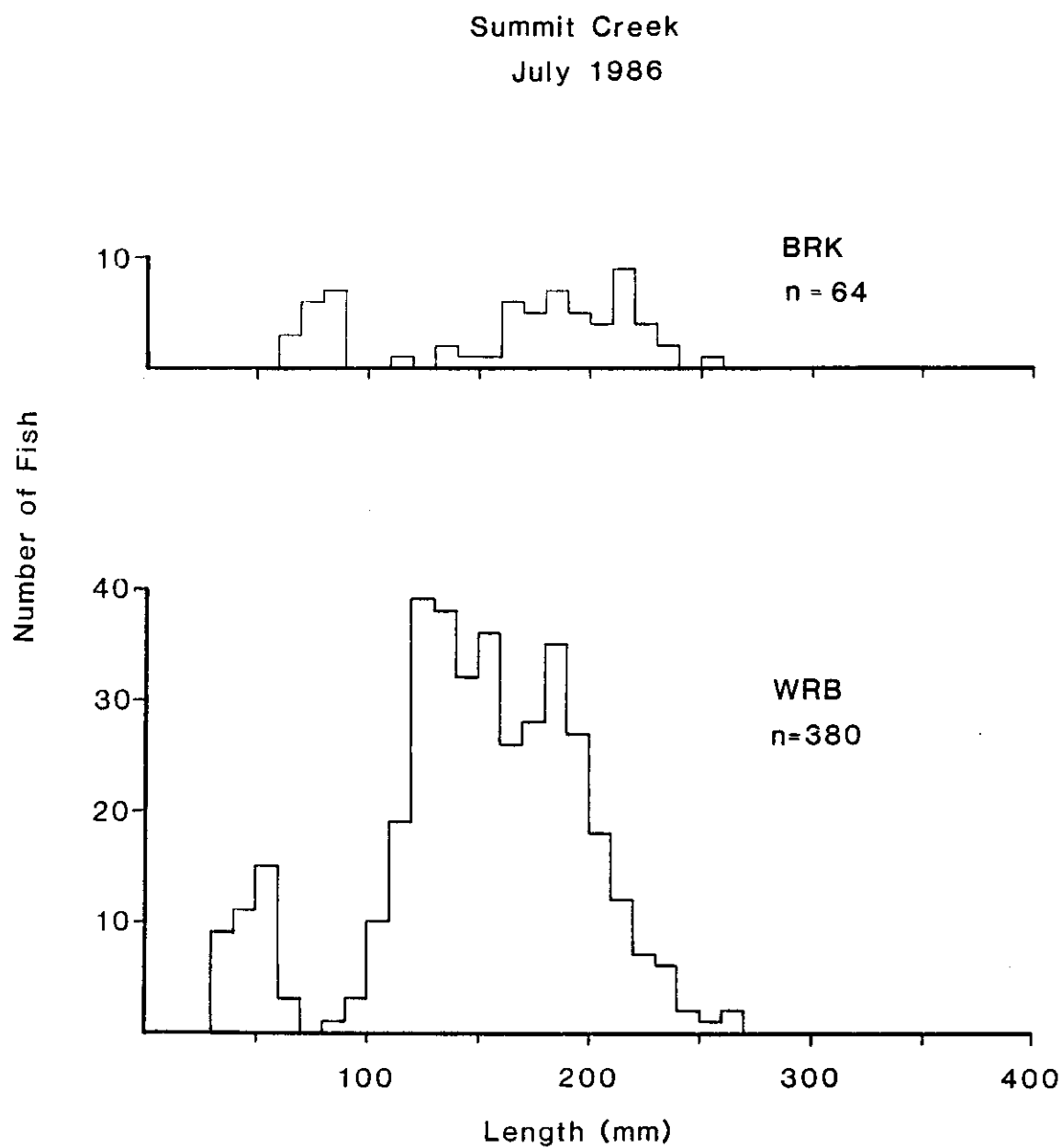


Figure 9. Length frequency distribution of fish captured from Summit Creek during 1986.

## Henrys Lake Outlet

### Salvage

We salvaged an estimated 24,000 cutthroat trout and RB x CT hybrids from Henrys Lake Outlet. Fish were distributed by hatchery truck to other regional waters in loads of approximately 1,500 fish. Waters receiving fish included: lower Henrys Lake Outlet (two loads), Big Springs area of the Henrys Fork (one load), Moose Creek (one load), Henrys Fork near Macks Inn (five loads), Teton River (one load), Buffalo River (four loads) and Island Park Reservoir (two loads). Outplants were designed to provide increased angling opportunities and to augment depleted cutthroat trout populations.

### Electrofishing

A total of 220 trout and 135 whitefish were captured during October sampling. Cutthroat trout were the most abundant species in the sample (n=98), followed by rainbow trout (n=67), brook trout (n=42) and RB x CT hybrids (n=13). Sampled cutthroat trout included several age classes from fry to adults, ranging in length from 45 mm to 399 mm (Fig. 10). Rainbow trout ranged from 70 mm to 244 mm in total length (Fig. 10); adults were absent, indicating the population may be migratory. Brook trout were represented by all age classes (Fig. 10). No fry were identified as hybrids, although it is likely some were because other age classes of hybrids were present (Fig. 10).

## Twin Creek

Species composition of the salmonid population in Section 1 consisted of brook trout (83.7%), cutthroat trout (7.0%), rainbow trout (1.5%) and whitefish (7.7%). The estimated number of fish was 129 (+10, 95% CI). In Section 2, the estimate was 17 fish (+3, 95% CI) with equal numbers of rainbow and cutthroat trout (46.7% each) and fewer numbers of brook trout (6.7%). The brook trout population consisted of juvenile and mature fish, indicating a resident stock. Rainbow and cutthroat trout were juveniles, probably the progeny of migratory fish from Henrys Lake Outlet.

## Targhee Creek

A fish ladder, constructed of 4-inch angle-iron and welded into 9 ft x 9 ft sections, was placed in Targhee Creek culvert on December 4. Eight sections, joined by heavy-duty chain bolted to the ends of each section, were placed on the culvert floor. The ladder is held in place by two steel posts driven into the gravel at the head end of the culvert and also by corrugation on the culvert floor. Rungs were spaced 3 ft apart. Rocks were placed at each rung to further disrupt flow. Total construction cost was approximately \$480 for labor and materials. Installation under severe winter weather conditions required 25 man-hours.

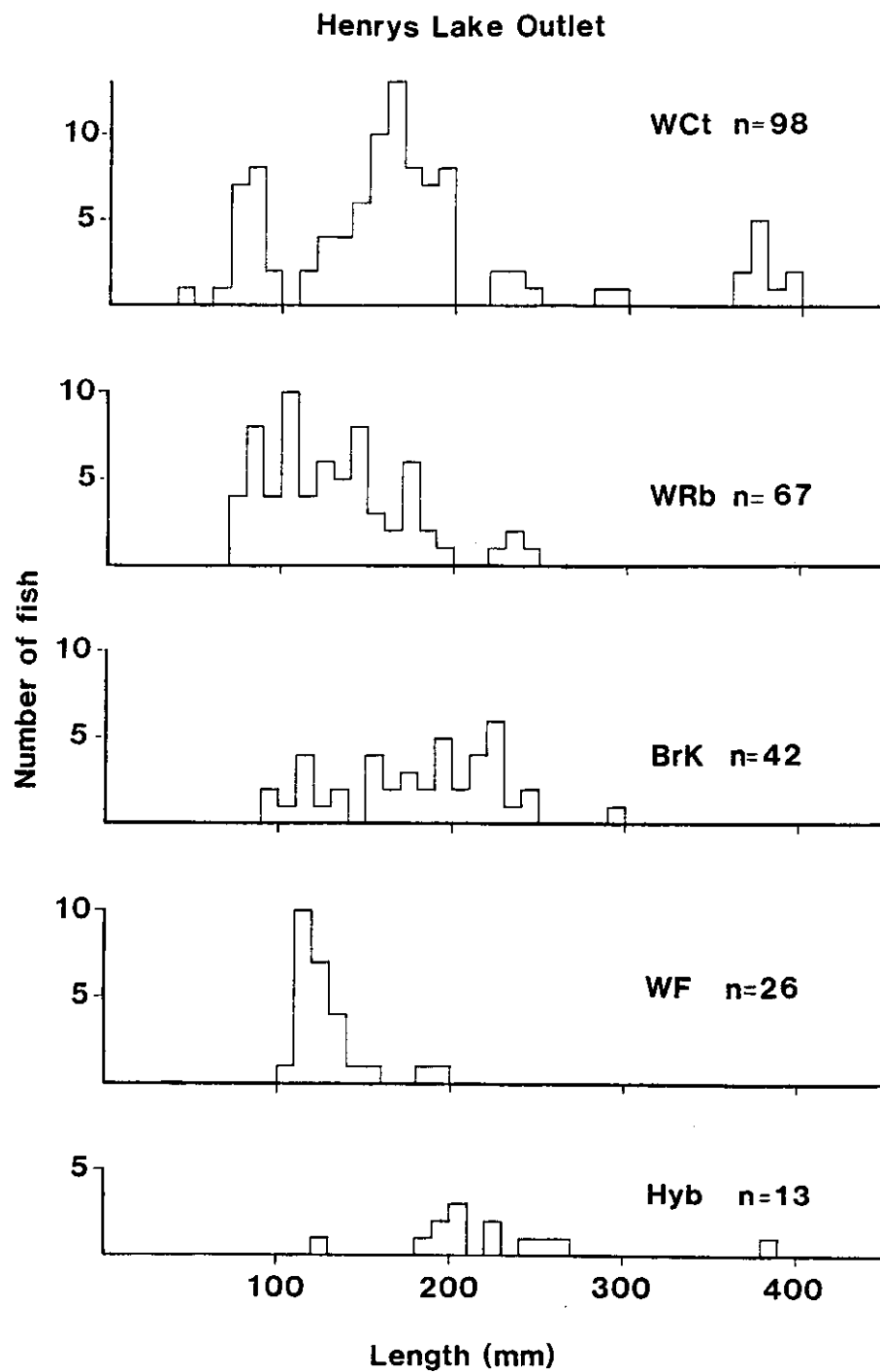


Figure 10. Length frequency distribution of fish captured from Henrys Lake Outlet during October 1986.

## **LITERATURE CITED**

- Corsi, C., B. Spateholts, V. Moore, and T. Williams. 1986. Regional Fishery Management Investigations. Federal Aid to Fish Restoration. Job Performance Report. Project F-73-R-8. Idaho Department of Fish and Game. 51 pp.
- Moore, V. and D. Schill. 1984. South Fork Snake River Fisheries Investigations. Project F-73-R-5. Job Completion Report. Idaho Department of Fish and Game. 133 pp.
- Vincent, D. 1971. River electrofishing and fish population estimates. Progressive Fish Culturist. 33:163-169.



## JOB PERFORMANCE REPORT

State of: Idaho Name: REGIONAL FISHERY MANAGEMENT  
INVESTIGATIONS  
Project No.: F-71-R-11  
Job No.: 6(IF)-c<sup>2</sup> Title: Region 6 (Idaho Falls) Rivers  
and Streams Investigations --  
Big Lost River Survey  
Period Covered: July 1, 1986 to June 30, 1987

### ABSTRACT\*

The upper Big Lost River drainage was assessed in 1986 to: (1) obtain information on wild fish populations, (2) evaluate the return of hatchery fish to the creel, (3) estimate catch and harvest and (4) assess habitat parameters.

Brook trout populations are confined primarily to the upper reaches of the Big Lost River drainage. Most brook trout mature at two to three years of age, when they reach lengths of 120 mm to 180 mm. Because of their small size at maturity, many brook trout spawn prior to harvest susceptibility; thus, populations are capable of withstanding high angler pressure. Few brook trout >250 mm were observed, but fish occasionally reached lengths of 450 mm. Brook trout densities ranged from 0/100 m<sup>2</sup> at several sites to 55/100 m<sup>2</sup> in Summit Creek. Other streams with high densities of brook trout included Cabin Creek and the upper East Fork.

Found throughout the drainage, rainbow trout are the most abundant trout species in the lower part of the watershed. They are also found in high numbers in spring-fed tributaries to the East Fork, where resident populations have developed. Tributary populations are primarily made up of fish that mature at lengths of 165 mm to 250 mm. Main stem fish typically do not mature until they reach lengths of 250 mm to 300 mm. Population sampling from main stem reaches indicated that wild rainbow trout are experiencing high mortality prior to spawning and densities are low. Angler harvest of juvenile fish is also believed to be impacting wild rainbow trout populations. Rainbow trout in main stems are capable of reaching lengths of 500 mm or more.

Whitefish distribution is almost entirely confined to main stem reaches of the upper Big Lost River, with occasional specimens found in tributaries. Whitefish densities ranged from 2.5 fish/100 m<sup>2</sup> to 8.0 fish/100 m<sup>2</sup> in main stem reaches.

Return of hatchery fish to the creel, based on creel census estimates, ranged from 5% on Lake Creek to 44% on North Fork. Overall, the return rate was 30%. With the exception of Wildhorse Creek (34% returns), hatchery returns from tributaries were typically low. An estimated 35% of fish stocked in Kane Creek were returned, but most were caught either in Summit Creek or the North Fork. The total number of catchables stocked in the upper Big Lost River should be reduced and confined to areas with high returns.

Anglers fished an estimated 29,133 hours on censused sections of the upper Big Lost River drainage during 1986. Catch rates ranged from 0.62 trout/hr on Wildhorse Creek to 2.37 trout/hr on upper East Fork and Starhope Creek. Overall catch rate for the drainage was 1.33 trout/hr. Whitefish contributed slightly to the fishery (catch rate of 0.05 fish/hr.)

Residents from over 20 counties made up 85% of the total anglers. The remaining percent of anglers were from 15 other states. The average angler fished 2.74 hours/day and harvested 1.5 trout. Most anglers (59%) used bait, followed by flies (30%) and lures (11%). Most anglers (74%) rated the fishing either good or excellent.

Most habitat in the upper Big Lost River drainage is in good condition. Cattle overgrazing has impacted parts of the East Fork and severely damaged most of Twin Bridges Creek. Wildhorse Creek has limited habitat in some reaches due to severe flooding. Beaver ponds located on spring seeps. are providing excellent brook trout habitat that otherwise would not exist.

Author:

Chip Corsi  
Regional Fishery Biologist

\*A complete report of the Big Lost River Survey is available under separate cover from Idaho Department of Fish and Game, P.O. Box 25, Boise, Idaho 83642.

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT  
INVESTIGATIONS

Project No.: F-71-R-11

Job No.: 6(IF)-d

Title: Region 6 (Idaho Falls)  
Technical Guidance

Period Covered: July 1, 1986 to June 30, 1987

### **ABSTRACT**

Technical assistance was provided to federal, state and local agencies upon request. Three fish kills were documented and investigated in 1986.

#### **Authors:**

Steve Elie  
Regional Fisheries Manager

Chip Corsi  
Regional Fisheries Biologist

## OBJECTIVES

1. To assist the Department of Water Resources and Corps of Engineers in evaluating the effects of habitat alteration on fish populations.
2. To recommend procedures that minimize adverse effects of stream and lake alterations.
3. To provide information on fisheries and aquatic habitat.

## TECHNIQUES USED

We responded to all requests for data, expertise and recommendations from individuals, government agencies and corporations. Meetings were attended and field inspections conducted as needed.

## FINDINGS

During 1986, we responded to 95 requests for technical assistance on water-related matters as listed below:

U.S. Forest Service	21
Idaho Department of Lands	4
Idaho Department of Water Resources	11
Corps of Engineers	6
Bureau of Land Management	4
Federal Energy Regulatory Commission	25
U.S. Fish and Wildlife Service	4
Bonneville County	5
Bureau of Reclamation	3
Idaho Department of Highways	7
Pond Permits	1
Soil Conservation Service	3
Sportsmen groups	<u>2</u>
Total	95

Some requests required several days of effort to fulfill.

Fish kills were confirmed on the Porter Canal, Texas Slough and Cellars Creek during 1986. Because Porter Canal is an irrigation canal, no action was taken, as the kill was associated with annual demossing. The Texas Slough kill is believed to be the result of irrigation return water, contaminated with demossing agent, entering the slough. Large numbers of trout, whitefish and nongame species were seen dead or dying, but it was not possible to confirm the source of the chemicals. No legal action was taken.

Several hundred juvenile cutthroat trout were lost in upper Cellars Creek, probably the result of aerial insecticide spraying at the Pasa La Coma girls camp. Conversation with a spray pilot, who voluntarily sprays the camp, indicated spraying had been done just prior to the kill. No legal action was taken, but Pasa La Coma agreed to not aerially spray the area in the future.

Submitted by:

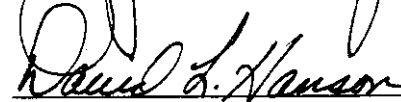
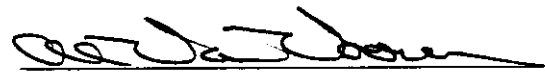
Steve Elie  
Regional Fishery Manager

Chip Corsi  
Regional Fishery Biologist

Dennis Aslett  
Wildlife Land Manager, Senior

Approved by:

IDAHO DEPARTMENT OF FISH & GAME

  
Jerry M. Conley, Director  
David L. Hanson, Chief  
Bureau of Fisheries  
Al Van Vooren  
Resident Fishery Manager